CITY AND COUNTY OF SAN FRANCISCO
BOARD OF SUPERVISORS
BUDGET AND LEGISLATIVE ANALYST

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Policy Analysis Report

To: Supervisor Campos
From: Budget and Legislative Analyst's Office
Date: May 13, 2015
Re: Analysis of the impact of short-term
        rentals on housing

Summary of Requested Action

Your office requested that the Budget and Legislative Analyst conduct an analysis on how short-term rentals affect the housing market in San Francisco, and how these effects might change given different limitations on the number of allowed nights housing units can be rented on a short-term basis. You also requested an overview of the Planning Department's short-term rental enforcement efforts and how they might be made more effective along with an assessment of how additional data on the short-term rental market might enhance their enforcement mandate.

For further information about this report, contact Fred Brousseau at the Budget and Legislative Analyst's Office.

Executive Summary

- Short-term rentals in recent years have become a new form of visitor lodging in San Francisco and throughout the world. While an informal market may have existed in the past, hosts can now make a spare room or an entire apartment or house available to potential visitors through websites such as Airbnb, Homeaway, Flipkey and others.

- Unlike a hotel or bed and breakfast inn, making one's personal residential space available for short-term rentals can be a low-cost and flexible undertaking for a host. It can also substitute for having a roommate for hosts who would otherwise need to share their space to cover their rent or mortgage.

- Guests can select from a variety of housing options and have the experience of staying in a home in a neighborhood not traditionally geared to tourism. The host can earn income by renting their space for as few or as many nights as they wish and that the market will bear. The platform companies have different arrangements but generally earn fees when bookings occur and/or when listings are posted by hosts.

- Though short-term rentals (defined as 30 days or fewer) were illegal in San Francisco until February 2015, between 5,249 and 6,113 of Airbnb listings in San Francisco were identified between November 2013 and February 2015 in Airbnb website webscrapes conducted by three individuals and made publically available. Comparable information for other hosting

platform companies was not available and is not included in the estimates prepared for this report, understating the estimated impacts reported.

- While specific locations are not disclosed, neighborhood locations can be identified from the Airbnb webscrapes. There are listings in almost all neighborhoods in San Francisco but concentrations of listings were found in the Inner Mission, Haight-Ashbury/Western Addition, Castro/Eureka Valley and Russian Hill/Polk Gulch.

- Numerous studies and assertions about the benefits and costs of the short-term rental market have been made. On the positive side, claims have been made that the short-term rental market increases tourism and its economic benefits, provides additional income for hosts, particularly those who would not otherwise rent out their housing unit or rooms, and benefits neighborhoods that tourists traditionally do not visit.

- On the negative side, some assert that short-term rentals take away already scarce housing for long-term rentals, may encourage tenant evictions if a landlord concludes that they can earn more from short-term rentals than from a long-term tenant, violates local zoning and other ordinances and negatively affects the quality of life in residential areas.

- To assess the impact of the 6,113 Airbnb listings identified as of December 2014 on the housing market in San Francisco, the Budget and Legislative Analyst developed a model to estimate bookings for those listings and to classify hosts as either casual or commercial.

- Casual hosts are defined by the Budget and Legislative Analyst as those who occasionally make their residences available for short-term rentals for supplemental income. For example, hosts who rent their entire unit on a short-term basis when they are away for a weekend, on vacation or otherwise travelling and would not otherwise rent the unit on a long-term basis are classified as casual. In the case of renting a room in their residences, casual hosts would not usually need or choose to have a roommate. Casual hosts are assumed not to be affecting the housing market since they would continue to occupy their housing unit in the absence of the short-term rental market.

- Commercial hosts for entire units are defined by the Budget and Legislative Analyst as those who probably do not live or could not live in their short-term rental unit and therefore rent it out as a means of generating income. For commercial hosts renting out rooms on a short-term basis, the motivation would be to cover rent or mortgage payments that would otherwise require having a roommate. The next best uses of the housing units for such hosts in the absence of the short-term rental market would be living in the unit themselves, placing the unit on the long-term rental market, or getting roommates. Commercial hosts are thus assumed to be removing housing units that would otherwise be available for the long-term rental market.

- The Budget and Legislative Analyst prepared estimates of the impact of short-term rentals on San Francisco's housing market using various assumptions and calculations about the number of bookings per listing and the threshold number of booked nights that distinguish casual and commercial Airbnb hosts. Three scenarios were developed with variations in assumptions, resulting in the distribution of host classifications shown in Exhibit A. The medium pact scenario, referred to as the primary scenario and presented in the main body

of this analysis, applied a threshold of 59 nights or more for commercial hosts of entire units. For private and shared rooms, the threshold was 89 or more booked nights.

Exhibit A: Number of Hosts by Type under 3 BLA Scenarios			
Host Type	Lower Impact Scenario	Medium Impact Scenario *(primary scenario used in this report)*	Higher Impact Scenario
Number of Casual Hosts	4,517	4,191	3,107
Number of Commercial Hosts	1,596	1,922	3,006
Total	6,113	6,113	6,113

▪ Assessing only the impact of commercial hosts that rent entire housing units for short-term rentals, the Budget and Legislative Analyst estimates that between 925 and 1,960 units citywide have been removed from the housing market from just Airbnb listings. At between 0.4 and 0.8 percent, this number of units is a small percentage of the 244,012 housing units that comprised the rental market in 2013 (the latest number available from the U.S. Census Bureau's American Community Survey). However, when compared to the 8,438 units reported as vacant by the American Community Survey in 2013, the percentage is estimated to be between 11.0 and 23.2 percent, as follows.

Exhibit B: Estimated Number of Commercial Entire Unit Listings as % of Vacant Units Citywide			
	Lower Impact Scenario	Medium Impact *(primary scenario used in this report)*	Higher Impact Scenario
Number of Commercial Entire Unit Airbnb Listings, 2014	925	1,251	1,960
Percent of 8,438 vacant units, 2013	11.0%	14.8%	23.2%

Sources: American Community Survey 2013, Budget and Legislative Analyst Utilization Model

▪ The impact of short-term rentals on the housing market varies by neighborhood. When adding the number of entire unit commercial listings to the number of vacant units in each neighborhood as of 2013, and calculating the percentage of total units potentially for rent, the impacts are highest in the Inner Mission, the Haight-Ashbury/Western Addition, the Castro/Eureka Valley, and Potrero Hill/South Beach, as follows. The primary scenario assumptions were used for these estimates. On the low side, the impact in nine neighborhoods was under 5 percent.

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Exhibit C: Primary Scenario: Impact on Vacant For Rent Housing of Commercial Short-term Rentals for Entire Housing Unit, by Neighborhood						
Zip Code	Neighborhood	Rental Market Size (2013)	Vacancy For Rent (2013)	Number of Commercial Entire Unit Listings	Total Potential Units for Rent	Airbnb Commercial Unit Listings as % of Total Potential for Rent
94117	Haight-Ashbury/Western Addition	14,686	260	122	382	31.9%
94110	Inner Mission	19,194	483	199	682	29.2%
94107	Potrero Hill/South Beach	9,121	246	85	331	25.7%
94114	Castro/Eureka Valley	9,921	358	117	475	24.6%
Source Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model, American Community Survey 2013						

- The Budget and Legislative Analyst's analysis of commercial host earnings from the short-term rental market compared to 2013 median gross rent earned for their neighborhoods found that, on average, hosts earned more in the short-term rental market than they would in the long-term rental market as of December 2014. Applying the hosts' December rates to the full year, an estimated 508 listings would have earned more than the 2014 median market rental rate of $3,750 per month. There were another approximately 200 listings generating slightly less than $3,750 per month but could have exceeded the median market rate with higher rates charged at peak months of the year. Some hosts probably earn less than the market rent but may not be offering housing comparable to what commands the median market rate.

- A number of the neighborhoods with the most commercial hosts also had high numbers of evictions in 2014 according to the City's Rent Board data. Exhibit D presents number of commercial hosts and number of evictions for the five neighborhoods with the highest number of evictions. While there are many reasons for evictions, and evictions for the purpose of conversion into a short-term rental is not tracked by the Rent Board, some landlords could be motivated to evict a tenant for the financial benefits of entering the short-term rental market.

Exhibit D: Neighborhoods with Most 2014 Commercial Hosts Compared to Evictions					
Zip Code	Neighborhood	Number of Commercial hosts	Number of Evictions	Neighborhood Evictions, as % of Total Evictions in San Francisco	Neighborhood Evictions, Ranked
94110	Inner Mission	315	323	12%	1st
94117	Haight-Ashbury/Western Addition	193	212	8%	3rd
94114	Castro/Eureka Valley	188	130	5%	10th
94109	Russian Hill/Polk Gulch	130	269	10%	2nd
94107	Potrero Hill/South Beach	126	51	2%	19th

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; San Francisco Rent Board

- Enforcement of the City's laws pertaining to short-term rentals that went in to effect in February 2015 has been hampered by the lack of information about the location and number of bookings per listing. Since short-term rentals operate in private residences and cannot be publically viewed and platform companies do not disclose addresses or booking information about their hosts, the City has limited information for enforcement.

- Hosts are required to pay hotel taxes for every booking and register with the City's Planning Department. The Treasurer and Tax Collector reports that hotel taxes are being paid by short-term rental hosts but cannot disclose information about the total number of hosts with business licenses. The Planning Department reports that, as of May 1, 2015, only 579 hosts had applied for now required registration and 282 certificates have been issues. Given the 6,113 listings identified for just Airbnb in December 2014, compliance with the registration requirement has been low.

Policy Options

The Board of Supervisors should consider the following actions:

1. Enact legislation requiring hosting platforms to provide host address information and booking information on a quarterly basis for enforcement purposes.

2. Enact legislation requiring hosting platforms to only list units and hosts that are registered with the City.

3. Enact legislation limiting the number of un-hosted nights allowed per year.

4. Amend the Planning Code to allow the Planning Department to levy fines on platforms that list unregistered hosts.

Project staff: Fred Brousseau, Julian Metcalf and Mina Yu.

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Background

Short-term Rental Market
The short-term rental market has three key players: the host, the guest, and the rental platform. The host is the property owner, lease holder, or a third party management company who supplies entire apartments, private rooms, or shared rooms. The guests rent out the apartments or rooms, and the rental platform facilitates the exchange between the hosts and guests.

Some municipalities, including the City and County of San Francisco, limit the number of days a short-term rental can be rented out and prohibit using residences solely for commercial purposes. Short-term rentals may provide a close substitute to hotel rooms or may offer a new type of lodging product by providing additional amenities such as full kitchens, easy access to different neighborhoods, and a more local and familiar experience of an area.

In San Francisco and in other cities, Airbnb is the predominant rental platform in the short-term rental market and generates revenue by taking a fee from both the host and guest for each booking completed (a pay-per-booking model). Other rental platforms such as HomeAway and FlipKey will offer a pay-per-booking option and also a subscription model, which charges hosts for advertising rentals.

Airbnb
This report focuses on Airbnb due to its predominance in the short-term rental market and the availability of public data on its activities. Airbnb originated in 2008. Airbnb has since expanded to over 34,000 cities and 190 countries and has over 1 million listings worldwide.[1] As of April 2014, Airbnb has raised nearly $800 million from investments firms including Andreessen Horowitz, Sequoia Capital, T. Rowe Price, and SherpaVentures. Airbnb has been valued at $20 billion,[2] which is higher than major hotel chains such as Hyatt Hotels Corporation ($8.4 billion).[3]

The Airbnb website allows for three types of rentals: 1) entire homes where the guest has access to the entire unit and the host is generally not present, 2) private rooms where the host is often present in the home, and 3) shared rooms, where hosts or others guests may sleep in the same room.

As detailed further below, using publically available webscrapes of Airbnb's San Francisco website, the Budget and Legislative Analyst identified 6,113 total listings in San Francisco from December 2014, consisting of entire units, private rooms and shared rooms. Details about these listings and their impacts on the housing market are provided below.

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[1] Airbnb. "About Us." *About*. Airbnb. Website. https://www.Airbnb.com/about/about-us. Accessed March 23, 2015
[2] Saitto, Serena. "Airbnb Said to Be Raising Funding at $20 Billion Valuation." Bloomberg Business. Bloomberg, February 28, 2015. Website. April 27, 2015. http://www.bloomberg.com/news/articles/2015-03-01/Airbnb-said-to-be-raising-funding-at-20-billion-valuation
[3] Samaan, Roy. LAANE. "Airbnb, Rising Rent, and the Housing Crisis in Los Angeles." March 2015

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Report estimates are Conservative

The Airbnb listings are only part of the short-term rental market so all conclusions and estimated short-term rental impacts presented in this report understate the full short-term rental market by an unknown amount although Airbnb is considered to have the largest number of short-term rental listings by many analysts. Neither company nor other public data was available for the other short-term rental platforms.

Besides excluding estimates of part of the short-term rental market, estimates in this report are conservative because housing stock and vacancy data was obtained from the American Community Survey conducted by the U.S. Census Bureau. The latest data from that source was from 2013 and based on five year averages ending that year.

Three Scenarios of Housing Impact were Developed for this Report

Since no single source of data was available to identify the exact number of short-term rental listings and bookings in San Francisco, estimates were prepared using different assumptions about bookings and the thresholds that distinguish casual from "commercial" short-term rental hosts. Details about the three scenarios are explained below. While all show an impact on the rental housing market, particularly in certain neighborhoods, the impacts vary from lower to medium to higher. For ease of reading, the medium impact scenario, referred to as the primary scenario, is presented in the main body of the text; the other two scenarios are presented as alternative scenarios at the end of the report. While all of the scenarios have strengths and limitations, the primary scenario is considered to be the most reasonable, with the most realistic assumptions by the Budget and Legislative Analyst.

Current Regulation in San Francisco

In the fall of 2014, San Francisco legalized short-term rentals. Previously illegal, the new law allowed permanent residents -- a person who occupies a unit for at least 60 consecutive days with the intent to make it their home -- to offer short-term rentals. There are some caveats: Hosts are required to register with the City's Planning Department; they must pay the City's hotel tax; un-hosted rentals, which are usually entire homes, are limited to 90 days per year; and each listing is required to carry liability insurance.

Short-term rentals are subject to the same 14 percent transient occupancy tax that hotels in the City pay. The Treasurer and Tax Collector of the City and County of San Francisco issued a ruling in 2012 that the City's Transient Occupancy Tax applied to short-term rental hosts and website companies. Airbnb has publicly stated that they have paid back taxes owed to the City and County, but the Treasurer is unable to confirm this due to taxpayer confidentiality laws. Airbnb reports that it has been collecting and remitting transient occupancy taxes on behalf of its hosts in San Francisco and remitting them monthly to the City. In a 2014 letter to its hosts in the City, Airbnb stated it is remitting "nearly $1 million" per month.

Positive Impacts and Claims Pertaining to Short-term Rentals

Strong Tourism Demand

Short-term rentals may provide many benefits to the City and its residents. Beyond the tax revenue that Airbnb reports, and the Treasurer and Tax Collector confirms, that it routinely collects and remits to the City, some studies report that short-term rentals can contribute to tourism, bringing additional customers to local businesses. In some cases, hosting may help individuals afford housing cost and other expenses.

Based on a study by the San Francisco Travel Association[4], short-term rentals accounted for an estimated 1.9 percent of all overnight tourists stays in the City in 2014. While, this is a relatively small proportion, it is significant when considering the City received an estimated 16.9 million visitors in 2013[5]. Applying the 2014 rate to the 2013 number of tourists means that 321,100 tourists stayed in short-term rentals that year.

The current hotel market in the City is reported to be one of the strongest in the country, with an occupancy rate of 84.1 percent in 2013[6], well above the national rate of 62.2 percent.[7] With the demand for hotel accommodations so strong, short-term rentals may present a unique option to accommodate tourist demand, especially during peak tourist seasons and large events. To this point, the San Francisco Travel Association recently partnered with Airbnb to be a provider of accommodations that the Association can sell to conferences as blocks for large events.[8]

The theory that short-term rentals contribute to increased tourism, rather than simply replace hotel stays outright, is supported by a 2014 study conducted by researchers at Boston University. The Boston University study analyzed short-term rentals across the state of Texas. The study found that every "1% increase in Airbnb listings in Texas results in a 0.05 percent decrease in quarterly hotel revenues." It also concluded that this loss to hotels and replacement mainly occurred on less expensive, lower-end hotels.[9] Assuming the same ratio applies to San Francisco, with its currently booming, often heavily booked hotel market, a potential loss of 0.05 percent would be exceeded by the average 2.0 percent year-over-year growth[10] or non-existent given the strong tourism demand. However, in the future if the market is declining, the substitution of short-term rentals compared to hotels

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[4] San Francisco Travel Association: Visitor Industry Economic Impact Summary, 2014

[5] San Francisco Travel Association

[6] San Francisco Center for Economic Development: Hotel Occupancy Rate and Other Features (2013), updated April 2014.

[7] American Hotel & Lodging Association, 2013 At-a-Glance Statistical Figures

[8] San Francisco Travel Association: Partners

[9] Boston University School of Management, "The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry" 2013, Boston University School of Management Research Paper Series No. 2013-16

[10] San Francisco Travel Association: Average growth of Room Night Demand from 2011 to 2014

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might be more noticeable. To determine the extent of the potential impact on San Francisco hotels a more robust study and access to additional data would be necessary.

Short-term Rentals May Increase Tourism Spending

Assuming the Boston University study results for Texas that the availability of short-term rentals results in a net increase in tourists is similarly applicable to San Francisco, increased visitors to the City should result in additional spending at local businesses. A study funded by Airbnb[11] concludes that in 2012 Airbnb guests generated "approximately $56 million in local spending and supported 430 jobs in San Francisco." The study also suggests that tourist spending by Airbnb guests is distributed to less visited neighborhoods across the City. However, there is limited data on the extent to which Airbnb guests spend time in their host neighborhood vs. traditional tourist neighborhoods and the study did not assess the neighborhood impact when short-term guests replace long-term residents.

Short-term Rentals May Provide New Supplemental Income for Some Hosts

Many supporters of short-term rentals have stated that their hosting business allows them to afford the cost of living in the City and to pay various expenses. Based on the Budget and Legislative Analyst's assessment of available data on income earned by Airbnb hosts, this seems to be true in some case. Still, there is a distinction to be made between two types of hosts assumed for this analysis: casual hosts who rent out entire units and rooms on an occasional basis and commercial hosts who rent out their rooms or entire units more frequently to maximize earnings and achieve other business objectives.

Casual hosts are defined for this analysis as those who may on occasion share a room with a guest or rent a private room or entire home when they are away but they would not choose otherwise to be in the business of renting out their space on a long-term basis. Available data shows that the income earned in these scenarios could reasonably be considered supplemental but does not equal what could be earned with more frequent bookings. In contrast, commercial hosts may substitute their rooms and entire home that may otherwise be available on the long-term market with short-term rentals either to earn more than could be earned through long-term rentals or for other reasons.

In addition to the Budget and Legislative Analyst's assessment, the scenario of the casual host is supported by two recent studies. The first, a survey of 344 hosts concluded in a draft report for Airbnb that 56 percent of hosts report using income from rentals listed on Airbnb to pay for part of their rent or mortgage.[12] The second study, by Rosen Consulting Group in 2013, surveyed users of Airbnb and

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[11] Airbnb.com "AIRBNB ECONOMIC IMPACT" http://blog.Airbnb.com/economic-impact-Airbnb/#san-francisco, accessed March 25, 2015

[12] HR&A Advisors, unpublished report for Airbnb on the economic impact assessment of Airbnb rental activities in San Francisco and New York City, October 2013. Some details are available from the (1)official press release from Airbnb.com, (2) article discussing results on Forbes.com, and (3) HR&A Advisor's summary on their client portfolio webpage.

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found that 42 percent report using short-term rental income to supplement living expenses.[13] Both studies were commissioned by Airbnb, but the survey results seem reasonable. The remaining 44 percent of hosts from the 2012 study and the 58 percent from the 2013 study are assumedly not supplementing living expenses with their rental revenue but are treating it as a steady source of income.

The Budget and Legislative Analyst prepared estimates of the number of casual and commercial Airbnb hosts as of 2014 under three scenarios for this analysis using different assumptions about the threshold number of bookings that distinguish casual and commercial hosts and about the number of bookings per listing. One of the three scenarios, which will be referred to as the primary scenario in this report, is the one the Budget and Legislative Analyst concludes is the most reasonable and is presented in the main body of this report. The results of the two other scenarios are presented in the Alternate Scenarios section at the end of this report.

For the primary scenario, the Budget and Legislative Analyst classified 69 percent of all hosts, or 4,191 of the 6,113 hosts identified, as casual. This higher than the 42 to 56 percent of hosts identified in the two studies cited above as hosts who use their earnings to supplement living expenses or help pay their rent or mortgage. The remaining 31 percent of hosts, or 1,922 of the 6,113 hosts are assumed to be operating their short-term rentals as a business and may be generating income above the amount they could earn on the long-term rental market and/or that otherwise suits their business and personal objectives such as not having long-term tenants covered by rent control and rent stabilization.

Negative Impacts and Claims Pertaining to Short-term Rentals

Short-Term Rentals Decrease Available Housing in San Francisco

Short-term rentals may exacerbate the housing shortage in San Francisco by offering a more lucrative alternative or a more flexible living arrangement to listing a unit on the long-term rental market.

With the three estimates of the number of commercial users by listing type, the Budget and Legislative Analyst estimates that commercial hosts of 1,251 entire homes or apartments, 631 private rooms and 40 shared rooms may generate higher income through Airbnb than from the long-term rental market, which is shown in Tables 6 and 7 below. Since these hosts can earn an estimated level of revenue that is above what they could earn on the long-term market, they have an incentive to remove their units from traditional long-term rental opportunities. Some hosts may also be attracted to participating in the short-term rental market in order to maintain a more flexible living arrangement. For example, a host may not wish to have a roommate or long-term tenants on a rent-stabilized lease. The ease of participation in the short-term offers these hosts an alternative to participation in the traditional long-term rental market.

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[13] Rosen Consulting Group, *Short-Term Rentals and Impact on the Apartment Market*. 2013

At 0.3 percent, the estimated 1,251 entire units being rented out by commercial Airbnb hosts is relatively small compared to the entire 376,083 units of housing in San Francisco, but larger when compared to the number of units available for rent at any one time, which was reported to be 8,438 in 2013 by the American Community Survey conducted by the U.S. Census Bureau. From this perspective, entire homes listed by commercial hosts take away an estimated 14.8 percent of the total rental housing available for rent Citywide, and private and shared rooms that might otherwise be occupied by roommates take even more units off the rental market. The impact on the rental stock in certain neighborhoods is higher, as detailed below.

Hosts operating casually are not assumed to take units off of the housing market since it is assumed that they occupy the unit themselves and only rent out only sporadically such as during their own vacations and trips away.

Short-Term Rentals May Encourage Tenant Evictions
Approximately 71.9 percent of San Francisco's rental stock is rent-stabilized, which typically results in rents below market rate. Housing market rental rates in San Francisco have been increasing significantly over the past few years so that for some landlords that may already be inclined to evict their tenants to capture current full market value rents, an additional incentive exists due to the higher revenue that could be generated through short-term renting. The San Francisco Rent Board reports that notices of eviction increased from 2,039 to 2,789, or by 37 percent, between 2011 and 2014. The Rent Board does not track what happens to units after evictions occur so it cannot be readily determined how many evictions resulted in housing units converted to short-term rental use. The Rent Board tracks filing of eviction notices only, though these are generally strong indicators of subsequent evictions. The Board does not systematically track successful evictions.

Many Short-Term Rentals May Violate Local Ordinances
In the fall of 2014, the Board of Supervisors legalized un-hosted short-term rentals (i.e., entire units) under 90 days, on the condition that hosts register with the Planning Department and apply for business licenses with Treasurer & Tax Collector. However, hosts have been slow to register; as of April 2015 455 hosts have registered. Given that seven publically available webscrapes report the number of listings on just the Airbnb platform as between 4,865 to 6,113 the rate of registration to date suggests that the majority of the current hosts are violating the required registration requirement.

Short-Term Rentals May Introduce Neighborhood Safety Risks and Decline in Quality of Life
The Planning Department has received noise complaints, concerns about parking, and other quality of life complaints from residents due to units suspected to be short-term rentals. These impacts seem plausible, but the extent and magnitude of these impacts have not been measured.

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Housing Stock Impacts

To determine the potential impact of short-term rentals on San Francisco's housing available for long-term rentals, the approach for this analysis was to first distinguish between hosts who rent out their homes or rooms in their home on an occasional, or casual, basis such as hosts who rent out their entire units when they are away on vacation, a business trip or away for a weekend. For private room rentals, an example of a casual host would be one who occasionally rents out rooms for supplemental income and perhaps for the experience of meeting people from elsewhere, but does not otherwise need or want a full-time roommate.

Hosts who own or rent homes for the express purpose of renting on the short-term rental market and, for the most part, do not live in the unit themselves or who regularly rent out rooms in their homes in lieu of having a roommate to cover rent and other expenses were classified as commercial hosts.

The Budget and Legislative Analyst concludes that commercial hosts affect the Citywide and, to varying degrees, neighborhood supply of housing available for the long-term rental market. Without commercial short-term rentals, the use of the housing units would assumedly be the owners living in the unit themselves or renting the unit out on a long-term basis. Hosts who rent out rooms on a more frequent short-term basis and who need the income to cover rent and other living expenses would assumedly turn to getting long-term roommates if not for short-term rentals.

While data is not publically available from the short-term rental platform companies on the frequency of bookings per listing, the Budget and Legislative Analyst assembled data to estimate the number of bookings per listing. Data on listings, neighborhoods, and host type (entire units, private rooms, shared rooms) were obtained and analyzed from several publically available webscrapes of the Airbnb website to create three scenarios based on three sets of assumptions about the number of bookings per listing and the number of bookings that distinguishes casual and commercial hosts.

Though neither the short-term rental platform companies nor any of the available webscrapes provide information on the frequency of bookings for individual listings, the Budget and Legislative Analyst used a multiple of the number of reviews per listing to estimate the number of bookings, or frequency of rental use of each listing, to categorize all listing hosts as either casual or commercial.

Since no single source of data was available to identify the exact number of short-term rental listings and bookings in San Francisco, estimates were prepared using different assumptions about bookings and thresholds distinguishing casual from "commercial" short-term rental hosts. All three scenarios show an impact on the rental housing market, particularly in certain neighborhoods, ranging from lower to medium to higher impact. The scenarios are summarized as follows:

Lower impact scenario: assumes casual hosts are those renting their unit 90 nights or fewer per year, commercial hosts rent out their units more than 90 nights per year, and the number of reviews for each listing represents 72 percent of total bookings for the listing.

Medium impact scenario (*referred to as primary scenario in this report*): assumes casual hosts are those renting their unit 58 nights or fewer per year, commercial hosts rent out their units more than 58 nights per year, and the number of reviews for each listing represents 72 percent of total bookings for the listing.

Higher impact scenario: assumes casual hosts are those renting their unit 58 nights or fewer per year, commercial hosts rent out their units more than 58 nights per year and the number of reviews for each listing represents 30.5 percent of total bookings for the listing (resulting in a higher number of bookings per listing than the other two scenarios).

As an example of the differences between the three scenarios, the Budget and Legislative Analyst classified Airbnb hosts as follows under the three scenarios:

	BLA Scenario		
	Lower Impact	**Medium Impact** *(primary scenario used in this report)*	**Higher Impact**
Number of Casual Hosts	4,517	4,191	3,107
Number of Commercial Hosts	1,596	1,922	3,006
Total	6,113	6,113	6,113

Casual hosts are assumed for the most part to be operating their short-term rentals to earn supplemental income or for other non-business reasons such as meeting travelers. Commercial hosts are assumed for the most part to be operating their short-term rentals as a business and may be generating income above the amount they could earn on the long-term rental market and/or otherwise fulfilling their business and personal objectives such as not having long-term tenants covered by rent control and rent stabilization.

As another example of differences between the three scenarios, in 2013, the American Community Survey estimated a 5-year average of 8,438 units as Vacant and For Rent in San Francisco, or 3.5 percent of the 244,012 units defined as the rental market at that time.[14] Based on the Budget and Legislative Analyst's model

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[14] The American Community Survey (ACS) is conducted annually by the U.S. Census Bureau. Compared to the relatively comprehensive 10-year Census, the ACS is a "mandatory ongoing statistical survey that samples a small percentage of the population every year." The ACS selects approximately 1-in-480 addresses to mail 3.5 million questionnaires annually. While this is a significant number of individuals and addresses surveyed, it still relies on statistical assumptions, which result in a margin of error for every ACS estimate. The ACS Rental Vacancy figures

used to prepare estimated impacts and the 5-year average number of units Vacant For Rent in 2013 reported by the American Community Survey, commercial hosts renting out entire units would have reduced the San Francisco rental stock by between 11 and 23.2 percent, in accordance with the three scenarios' assumptions, as follows:

	Lower Impact	Medium Impact *(primary scenario used in this report)*	Higher Impact
Number of Commercial Entire Unit Listings, 2014	925	1,251	1,960
Percent of 8,438 vacant units, 2013	11.0%	14.8%	23.2%

Sources: American Community Survey 2013, Budget and Legislative Analyst Utilization Model

For ease of reading, the primary scenario only is presented in the following main body of the text; the lower and higher impact scenarios are presented as alternative scenarios at the end of the report. While all three scenarios have strengths and limitations, the primary scenario is considered to be the most reasonable, with the most realistic assumptions, by the Budget and Legislative Analyst. The results of the two other scenarios are presented in the Alternate Scenarios section at the end of this report.

Table 1 summarizes the Budget and Legislative Analyst's classification of short-term rental hosts for Airbnb using only primary scenario assumptions. As shown, the total number of housing units listed in 2014 was 6,113, of which 4,191, or 69 percent, were classified by the Budget and Legislative Analyst as casual, and the other 1,922 units, or 31 percent, were classified as commercial. The threshold number of days to distinguish casual and commercial hosts is shown for each type of host for the primary scenario. Commercial hosts are those that book their space for more than 58 days for entire units and more than 88 days for private or shared rooms. Those amounts are the average number of booked nights reported for each host type in an unpublished report prepared for Airbnb and obtained by the Budget and Legislative Analyst.[15]

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include all units listed for rent but currently not occupied and all units that are rented but have yet to be occupied by the incoming tenant. The total number of units that are vacant but have incoming tenants is expected to be small, but does somewhat inflate the size of the available rental units listed on the market.

[15] HR&A, "Airbnb Economic Impacts in San Francisco and its Neighborhoods," November 2012

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Table 1: Primary Scenario: Estimated Number of Short-term Rental Housing Units in San Francisco, by Type of Host, 2014			
Type of Host/Listing	Threshold Number of Days Unit Rented	Estimated Number of Units as of December 2014	Percentage of Total Units
Casual: Entire unit	58 days or less	2,400	39%
Casual: Private room	88 days or less	1,565	26%
Casual: shared room	88 days or less	226	4%
Total casual:		*4,191*	*69%*
Commercial: Entire unit	over 58 days	1,251	20%
Commercial: Private room	over 88 days	631	10%
Commercial: Shared room	over 88 days	40	1%
Total commercial:		*1,922*	*31%*
TOTAL UNITS		6,113	100%

Source: Webscrape prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

To determine the impact of the commercial hosts on the rental market, the Budget and Legislative Analyst relied on the U.S. Census Bureau's American Community Survey data from 2013 which reports total number of housing units in the San Francisco rental market and total number of vacant housing units available for rent, by neighborhood. This data, the most recent available from the American Community Survey, may overstate the number of units available currently since the published data is from 2013 and based on a five year average for the years leading up to 2013.

Table 2 summarizes the data sources used for the analysis. Further details and sources and methods are provided below.

	Table 2: Information Sources Used for Analysis				
Variable	**Total Housing Units in San Francisco Rental Market (2013)**	**Vacant Housing Units for Rent in San Francisco, by Neighborhood (2013)**	**Airbnb Listings in San Francisco, by Neighborhood (2014)**	**Number of Reviews per Listing**	**Multiple: Number of Bookings per Listing Derived from Number of Reviews per Listing**
Source	American Community Survey, U.S. Census Bureau	American Community Survey, U.S. Census Bureau	2014 Webscrape of Airbnb website	2014 Webscrape of Airbnb website	Statement by Airbnb Co-Founder and CEO [16] (72 percent, used for Lower & Medium Impact scenarios) New York State Attorney General's Subpoenaed Airbnb Data for New York City (30.5 percent, used for Higher Impact scenario)[17]
Purpose	To identify total units in rental market	To identify rental vacancy rate for San Francisco and by neighborhood	To identify number of housing units being used by Airbnb	To apply to Multiple explained in next column	To apply to number of reviews per listing to determine frequency of bookings/listing

Data Sources

This report considers the impacts of short-term rentals on housing availability in San Francisco, and data from the American Community Survey, Zillow, Trulia, the San Francisco Rent Board, various webscrapes of the Airbnb website, and other reports on the short-term rental market such as those produced by and for the City's Planning Department, Airbnb press releases and public statements, and our own internal review of Airbnb.com were used.

The Budget and Legislative Analyst's Office sent a request for anonymized listing and booking data to Airbnb in April 2015 but the company did not respond. Therefore, the Budget and Legislative Analyst Office utilized 7 webscrapes of the Airbnb website and cross-referenced this information with actual Airbnb data obtained through subpoena and reported by the New York State Attorney General's Office in

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[16]Chesky, Brian. September 7, 2012. "What percent of Airbnb hosts leave reviews for their guests?" Retrieved on May 6, 2015 from: http://www.quora.com/What-percent-of-Airbnb-hosts-leave-reviews-for-their-guests
[17] This rate was used to calculate a high estimate of the number of units removed from the long-term market by neighborhood, as shown in the Alternate Scenario section below.

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2014, a report prepared for Airbnb[18] and Airbnb's press releases and public statements.

Source of Webscrape data

The Budget and Legislative Analyst's Office reviewed seven webscrapes of the Airbnb website prepared by three technology professionals. Webscrapes extract and compile data from the public-facing websites and allow for analysis that would otherwise not be feasible or practical to conduct using a standard browser. All seven of the webscrapes reviewed show a consistency over time in the number of Airbnb listings and in rental rates. The December 2014 webscrape prepared by Murray Cox was used by the Budget and Legislative Analyst for this analysis as this dataset provided the most comprehensive collection of data. Summary information from each of the seven webscrapes is provided in the Appendix to this report.

The webscrapes used were prepared by the following three individuals. Tom Slee, who works in the software industry, writes about technology and politics, is active in the open data and sharing economy communities, and is based in Waterloo, Ontario. Murray Cox is a community activist based in New York City who utilizes his technology skills for various non-profits and community groups. He has a degree in computer science from the University of Sydney. Gus Dolan collaborates with the Anti-Eviction Mapping Project.

Webscrapes are subject to limitations: there may be duplicate or inaccurate listings, and webscrape authors may run the scrapes several times to reduce error. Because of the consistency of the information in the webscrapes reviewed, the Budget and Legislative Analyst concluded that they were reliable sources of information for this analysis.

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[18] New York State Attorney General, "Airbnb in the City." Office of the Attorney General of the State of New York's Research Department and Internet Bureau. October 2014

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Table 3: Number of San Francisco Airbnb Listings, by Listing Type December 2014			
Number of Entire Unit Listings	**Number of Private Room Listings**	**Number of Shared Room Listings**	**Total Number of Listings**
3,651	2,196	266	6,113

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014

The Budget and Legislative Analyst conducted a review and sampling of Airbnb's current San Francisco listings to confirm summary statistics of the webscrapes. Average prices were checked by listing type for each webscrape against the website's reported averages. Table 4 below shows the average prices from the webscrape used for this analysis. See the Appendix for more detail about how the webscrapes were used for this analysis.

Table 4: Average San Francisco Airbnb Prices, by Listing Type December 2014			
Average Price of Entire Unit Listings	**Average Price of Private Room Listings**	**Average Price of Shared Room Listings**	**Average Price of All Listings**
$239	$115	$72	$239
Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014			

Limitations of data
The number of bookings is key to understanding the impact of the short-term rental market on housing in San Francisco. Hosts have the option to unlist or deactivate listings, but it is unclear whether listings expire; thus, units that are not currently being booked may still be listed. Data from the webscrapes do not provide information on bookings. However, the Budget and Legislative Analyst utilized the number of reviews left on each listing to estimate the booking frequency, or utilization rate, in booked nights per year for each listing. See the Appendix for detail on our methodology.

Airbnb and other platforms obscure the location of a host's unit on their website so it is not possible to determine exact locations. Neighborhoods are identified for each listing, although inconsistently and without clear definition. To help determine neighborhood locations for listings, zip codes were pulled from some of the webscrapes. The neighborhood locations used in our analysis are expected to approximate to within 0.6 miles of their true location.

Review Data Key to Estimating Utilization
Because data from the webscrapes do not provide information on the number of bookings, two estimates of bookings were prepared: 1) Airbnb's public statement that 72 percent of guests leave reviews was applied to all listings with reviews to

determine the total number of bookings per listing (i.e., assuming that the number of reviews per listing represented 72 percent of all bookings for that listing), and 2) a second, lower review rate of 30.5 percent was applied based on the number of reviews per listing reported from a webscrape of New York City Airbnb listings and compared to the number of bookings for the same time period in New York City as reported by the New York State Attorney General in subpoenaed Airbnb booking data. That report showed a total of 497,322 bookings from January 1, 2010 through June 2, 2014. When compared with the webscrape results showing a review count of 151,623 from January 1, 2010 through June 2, 2014, the rate of apparent reviews to bookings was determined to be 30.5 percent.

The apparent review ratio of 30.5 percent may not represent the actual rate that users leave reviews. Some sources suggested that Airbnb alters the number of reviews on their website, and may remove older reviews over time. If true, this would explain the difference between the apparent review rate and Airbnb statements from 2012 that 72 percent of guests leave reviews. Both the apparent review ratio and Airbnb's stated ratio are all well above common ratios assumed for the e-commerce and other online industries, which have been estimated to range between one[19] to nine percent, but the Airbnb business model appears to be more dependent on reviews than some other businesses .[20] [21]

The 72 percent review rate was used for the primary scenario estimates presented in this report. The 30.5 percent review rate was used for the higher impact alternate scenario presented in this report.

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[19] Arthur, Charles. "What is the 1% rule?" theguardian.com July 19, 2006. Web. April 30, 2015. http://www.theguardian.com/technology/2006/jul/20/guardianweeklytechnologysection2http://nautil.us/issue/12/feedback/one-percenters-control-online-reviews

[20] Ford, Mat. "The Pareto Principle and the 1% Rule of Internet Culture. Mattyford.com. June 4, 2014. Web. 30 Apil, 2015. http://mattyford.com/blog/2014/6/5/the-pareto-principle-and-the-1-rule-of-internet-culture

[21] "What Percentage of People Write Reviews?" http://reviewreputation.com/what-percentage-of-people-writes-reviews/

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Many Types of Hosts

As discussed above, for purposes of this analysis, the Budget and Legislative Analyst categorized hosts into one of two groups: casual hosts and commercial hosts depending on the number of nights their unit was booked. For entire units rented in the primary scenario for this analysis, the threshold for commercial hosts was 59 booked nights or more. Casual hosts for entire units were those with 58 or fewer booked nights. For private and shared rooms, the threshold was 88 or fewer booked nights for casual hosts and 89 or more booked nights for commercial hosts.

Casual hosts are defined for this analysis as those who list units on an ad hoc basis to make supplemental income. A casual host might be a host who lists their unit for rent a few weekends throughout the year or while on an out-of-town trip. Casual hosting is assumed to have little or no impact on the long-term rental market.

Commercial hosts with more than 58 booked nights per year for an entire home or 88 nights or more for private or shared room listings are renting out a room for over 7 days per month or a whole unit for almost 5 days a month. Commercial entire unit hosts would need to be out of their residences to rent them out for approximately two months or more per year. Commercial hosting is assumed by the Budget and Legislative Analyst to reduce the number of units or rooms available for long-term rent. A commercial host is one that practices short-term renting as a business instead of listing a unit on the long-term rental market.

The Budget and Legislative Analyst assumes that there are exceptions to the casual and commercial classifications above. There are likely hosts who travel or stay elsewhere more than 59 days a year, rent out their entire primary residence unit while they are gone and therefore are not taking a housing unit away from the long-term rental market. Similarly, there are likely hosts who rent entire units for 58 days or less though they do not live in the unit, but would otherwise make it available to the long-term market.

Using the data from the December 2014 San Francisco Airbnb webscrape, the Budget and Legislative Analyst created a utilization model for the number of nights per year a listing is expected to be booked based on the number of reviews for each listing. For the primary scenario presented in this report, the following data was used: the 72 percent review to bookings ratio, 5.1 average nights of stay for Airbnb guests as reported by SF Travel, and the length of time from the host join date to the last review date. To determine the number of bookings per month for each listing, total bookings were spread over the amount of time since the host joined the site since that data was available from the 2014 webscrape. The detailed methodology for calculating this utilization rate is found in the Appendix.

Based on the utilization model and the thresholds described above to distinguish between casual and commercial hosts, Figure 5 below shows the distribution of the 6,113 Airbnb listings from the December 2014 webscrape across San Francisco by type of host under the primary scenario assumptions. As presented in Table 1

above, the primary scenario assumes 4,191 casual hosts and 1,922 commercial hosts for a total of 6,113.

**Figure 5: Distribution of Casual and Commercial Hosts in San Francisco
December 2014**

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

Commercial Hosts Expected to Have Greater Impact on Housing Availability

At 68.6 percent, the 4,191 hosts classified as casual is slightly more than two thirds of all 6,113 listings. Casual hosts are not expected to reduce the rental stock due to the infrequency of and the motivations for their hosting. As shown Table 6 below, casual hosts are expected to earn significantly less than median gross rent for their neighborhoods on the short-term rental market based on the number of nights their unit is booked as estimated by our utilization model and the price a host charges per night.

Table 6: Differences between Short-term vs Long-term Monthly Revenue Generated by Casual Hosts for Entire Units, 2014				
Zip Code	Neighborhood	Average Monthly Revenue for Entire Unit, Casual Host	Median Gross Rent, by Neighborhood (2013)	Monthly Earnings Above/(Loss Below) Long-term Rent
94102	Tenderloin/Union Square/Hayes Valley	$211	$840	($629)
94103	SOMA	$216	$922	($706)
94104	Financial District	$159	$673	($514)
94105	Rincon Hill	$258	$2,000+	($1,742)
94107	Potrero Hill/South Beach	$240	$2,000+	($1,760)
94108	Chinatown	$289	$1,019	($730)
94109	Russian Hill/Polk Gulch	$255	$1,379	($1,124)
94110	Inner Mission	$260	$1,459	($1,199)
94111	Telegraph Hill/Waterfront	$204	2,000+	($1,796)
94112	Ingleside/Excelsior	$189	$1,398	($1,209)
94114	Castro/Eureka Valley	$329	$1,771	($1,442)
94115	Western Addition	$328	$1,563	($1,235)
94116	Parkside	$208	$1,639	($1,431)
94117	Haight-Ashbury/Western Addition	$262	$1,732	($1,470)
94118	Inner Richmond	$300	$1,621	($1,321)
94121	Outer Richmond	$247	$1,512	($1,265)
94122	Sunset	$195	$1,663	($1,468)
94123	Marina/Cow Hollow	$278	$1,838	($1,560)
94124	Bayview/Hunters Point	$127	$892	($765)

Table 6: Differences between Short-term vs Long-term Monthly Revenue Generated by Casual Hosts for Entire Units, 2014 (cont'd)				
94127	Miraloma/Sunnyside	$294	$2,000+	($1,706)
94129	Presidio	$39	no data	
94130	Treasure Island	$178	$1,582	($1,404)
94131	Twin Peaks/Glen Park	$318	$1,728	($1,410)
94132	Lake Merced	$104	$1,797	($1,693)
94133	North Beach	$316	$1,274	($958)
94134	Visitacion Valley/Portola	$240	$1,101	($861)
94158	Mission Bay	$174	$2,000+	($1,826)
City-wide Average		$260	$1,516	($1,740)

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013 median gross rents

However, the estimated average monthly revenue from a commercial host for entire units exceeds the expected long-term rental rates per month. The table below shows that there is a financial incentive to list a unit on the short-term rental market, as it can generate revenues above median rents for each neighborhood.

Zip Code	Neighborhood	Average Monthly Revenue for Entire Unit, Commercial Host	Median Gross Rent by Neighborhood (2013)	Monthly Earnings Above/(Loss Below) Long-term Rent
	Table 7: Differences between Short-term vs Long-term Monthly Revenue Generated by Commercial Hosts for Entire Units, 2014			
94102	Tenderloin/Union Square/Hayes Valley	$2,264	$840	$1,424
94103	SOMA	$2,708	$922	$1,786
94104	Financial District	$2,412	$673	$1,739
94105	Rincon Hill	$2,644	$2,000+	$644
94107	Potrero Hill/South Beach	$2,400	$2,000+	$400
94108	Chinatown	$2,952	$1,019	$1,933
94109	Russian Hill/Polk Gulch	$2,382	$1,379	$1,003
94110	Inner Mission	$2,356	$1,459	$897
94111	Telegraph Hill/Waterfront	$2,351	2,000+	$351
94112	Ingleside/Excelsior	$1,784	$1,398	$386
94114	Castro/Eureka Valley	$2,703	$1,771	$932
94115	Western Addition	$2,438	$1,563	$875
94116	Parkside	$1,834	$1,639	$195
94117	Haight-Ashbury/Western Addition	$2,910	$1,732	$1,178
94118	Inner Richmond	$2,050	$1,621	$429
94121	Outer Richmond	$1,977	$1,512	$465
94122	Sunset	$2,074	$1,663	$411
94123	Marina/Cow Hollow	$2,723	$1,838	$885
94124	Bayview/Hunters Point	$1,721	$892	$829
94127	Miraloma/Sunnyside	$2,030	$2,000+	$30
94130	Treasure Island	$1,572	$1,582	($10)
94131	Twin Peaks/Glen Park	$2,263	$1,728	$535
94132	Lake Merced	$2,083	$1,797	$286
94133	North Beach	$2,826	$1,274	$1,552
94134	Visitacion Valley/Portola	$2,006	$1,101	$905
94158	Mission Bay	$2,779	$2,000+	$779
City-wide Average		$2,440	$ 1,516	$440

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013 median gross rents

Commercial hosts are expected to have a larger impact on the housing market. Entire units listed by commercial hosts would reduce the number of long-term rental units available, while private and shared rooms would reduce the number of rooms available for long-term rent. Entire units make up the majority of commercial units listed at 1,251 homes or apartments.

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In 2013, the American Community Survey estimated a 5-year average of 8,438 units as Vacant For Rent in San Francisco, or 3.5 percent of the 244,012 units defined as the rental market at that time by the Census Bureau.[22] Based on the model developed for this analysis and the 5-year average Vacant For Rent in 2013 reported by the American Community Survey, the 1,922 commercial hosts renting entire units for over 58 days a year would reduce the San Francisco rental stock by an amount equal to 14.8 percent of the 8,438 units Vacant For Rent Citywide in San Francisco under the primary scenario assumptions. The range of this impact is between 11.0 and 23.2 percent based on the lowest to highest impact scenario assumptions. Rentals for private and shared rooms would reduce the available rental stock even further.

While commercial short-term rental hosts appear to be beating the median rents across the City in the data we examined, the Budget and Legislative Analyst also compared short-term rental revenues to the median $3,750 rental market rate in 2014.[23] Comparing data to this market rate, there were a total of 508 units in December 2014 beating the market rate—286 entire rooms, and 222 private rooms.

There were also about 200 units that generated just slightly less revenue than the median market rate. For example, a commercial entire home in the Castro which earned an average of approximately $330 per night, and was booked an estimated 134 nights per year earned about $3,690 per month, or slightly less than the 2014 City-wide median rent of $3,750. However, if the unit was booked just three more nights in the year or charged higher rates at other times of year, the short-term rental listing would be more profitable than the long-term market rates. Thus, the short-term rental market can offer similar financial compensation with an added flexibility in living arrangements over the long-term rental market.

The data from December 2014 shows that over two-thirds of the hosts could have potentially earned more by listing their units in the long-term rental market if their unit could have commanded the then median market rate of $3,750.[24] However, other factors affecting this calculation include:

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[22] The American Community Survey (ACS) is conducted annually by the U.S. Census Bureau. Compared to the relatively comprehensive 10-year Census, the ACS is a "mandatory ongoing statistical survey that samples a small percentage of the population every year." The ACS selects approximately 1-in-480 addresses to mail 3.5 million questionnaires annually. While this is a significant number of individuals and addresses surveyed, it still relies on statistical assumptions, which result in a margin of error for every ACS estimate. The ACS Rental Vacancy figures include all units listed for rent but currently not occupied and all units that are rented but have yet to be occupied by the incoming tenant. The total number of units that are vacant but have incoming tenants is expected to be small, but does somewhat inflate the size of the available rental units listed on the market.

[24] Zillow.com, San Francisco Home Prices & Values. Accessed on May 10, 2015 at http://www.zillow.com/san-francisco-ca/home-values/

[24] Zillow.com, San Francisco Home Prices & Values. Accessed on May 10, 2015 at http://www.zillow.com/san-francisco-ca/home-values/

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- The calculations above are based on short-term rental rates charged in December 2014. Hosts may have charged higher rates at other times of year such as summer and thus their total annual income could be higher than the projected amounts based on December rates.

- Some short-term hosts could be renting units with market values below the median market rate so they could still be beating the market value for their particular unit even if their earnings or less than the total market median amount.

- Some of the short-term rental housing stock may not match the amenities of the median market rate housing stock and therefore it may not be possible to earn median market rent through long-term rentals compared to landlords with newer apartments and/or more amenities.

- Some commercial short-term rental hosts may not be marketing their units effectively to maximize rentals.

- Short-term rental and hotel competition may prevent some commercial short-term hosts from charging rates to earn more than a long-term rental would generate.

- Some commercial hosts may be satisfied earning more than they had in the long-term rental market though less than the median market rental rate as they may prefer the flexibility of short-term rentals and may not wish to rent their unit(s) on a long-term basis under City rent control laws.

Some commercial hosts may be in the hospitality business and not interested in entering the long term rental market.

Commercial Short-term Rentals by Neighborhood

Table 8 below shows the rental market size, vacancy for rent, and the estimates of commercial listings on Airbnb by neighborhood zip code under the primary scenario. The same results for the lower and higher impact scenarios are presented at the end of the report in the Alternative Scenarios section.

Zip Code	Neighborhood	Rental Market Size (2013)	Vacancy For Rent (2013)	Number of Commercial Entire Unit Listings	Total Potential Units for Rent	AirBnb Commercial Unit Listings as % of Total Potential Units
	Table 8: Primary Scenario: Impact on Vacant For Rent Housing of Commercial Short-term Rentals for Entire Housing Unit, by Neighborhood					
94158	Mission Bay	2,273	0	2	2	100.0%
94127	Miraloma/Sunnyside	1,614	24	19	43	44.2%
94117	Haight-Ashbury/ Western Addition	14,686	260	122	382	31.9%
94110	Inner Mission	19,194	483	199	682	29.2%
94114	Castro/Eureka Valley	9,921	358	117	475	24.6%
94107	Potrero Hill/South Beach	9,121	246	85	331	25.7%
94131	Twin Peaks/Glen Park	6,723	181	45	226	19.9%
94105	Rincon Hill	2,239	60	18	78	23.1%
94122	Sunset	12,780	202	60	262	22.9%
94118	Inner Richmond	12,665	194	40	234	17.1%
94121	Outer Richmond	11,117	192	43	235	18.3%
94115	Western Addition	15,041	305	52	357	14.6%
94123	Marina/Cow Hollow	11,211	495	84	579	14.5%
94133	North Beach	12,270	349	59	408	14.5%
94112	Ingleside/Excelsior	8,686	175	28	203	13.8%
94111	Telegraph Hill/ Waterfront	1,892	35	2	37	5.4%
94116	Parkside	5,931	205	22	227	9.7%
94109	Russian Hill/Polk Gulch	30,551	1,099	89	1188	7.5%
94103	SOMA	11,460	899	71	970	7.3%
94108	Chinatown	7,697	377	24	401	6.0%
94104	Financial District	259	52	2	54	3.7%
94134	Visitacion Valley/Portola	5,067	112	6	118	5.1%
94102	Tenderloin/Union Square/Hayes Valley	16,644	1360	54	1414	3.8%
94124	Bayview/Hunters Pt	5,932	146	4	150	2.7%
94132	Lake Merced	6,793	356	4	360	1.1%
94129	Presidio	1,385	159	0	159	0.0%
94130	Treasure Island	860	114	0	114	0.0%
TOTAL		244,012	8,438	1,251	9,689	12.9%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013

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Private Room Commercial Hosts

No historical data on roommate market was available, but an average number of bedrooms by neighborhood was calculated based on American Community Survey data. We multiplied the number of Vacant For Rent units by the Average Number of Rooms by zip code to get the number of Vacant Rooms For Rent. Based on 2013 American Community Survey data, 12,884 rooms were available for rent in San Francisco in 2013.

In addition to the number of entire units presented above, 631 commercial private rooms and 40 commercial shared rooms were listed on the Airbnb webscrape from December 2014. The number of shared rooms were divided by 2 to estimate the number of rooms these commercial shared rooms listings accounted for, and we estimate that 651 commercial rooms were listed in December 2014.

Table 9 below shows the range of commercial room listings and impacts by neighborhoods.

Zip Code	Neighborhood	Room Rental Market Size (2013)	Vacancy For Rent (2013)	Number of Commercial Room Listings	Total Potential Rooms for Rent	Airbnb Commercial Room Listings as % of Total Potential Units
Table 9: Primary Scenario: Impact on Vacant For Rent Housing of Commercial Short-term Rentals for Private Rooms, by Neighborhood						
94130	Treasure Island	No data	0	4	4	**100%**
94158	Mission Bay	2,705	0	1	1	**100%**
94127	Miraloma/Sunnyside	7,659	71	12	83	**14%**
94117	Haight-Ashbury/Western Addition	19,568	471	71	542	**13%**
94110	Inner Mission	29,276	940	114	1,054	**11%**
94107	Potrero Hill/South Beach	14,829	388	40	428	**9%**
94114	Castro/Eureka Valley	17,880	696	71	767	**9%**
94105	Rincon Hill	4,651	89	8	97	**8%**
94112	Ingleside/Excelsior	23,498	446	39	485	**8%**
94118	Inner Richmond	18,649	409	33	442	**7%**
94131	Twin Peaks/Glen Park	13,787	385	21	406	**5%**
94111	Telegraph Hill/Waterfront	2,643	46	3	49	**5%**
94115	Western Addition	18,968	488	27	515	**5%**
94122	Sunset	23,459	454	25	479	**5%**
94124	Bayview/Hunters Point	11,096	372	19	391	**5%**
94133	North Beach	14,987	520	24	544	**4%**
94121	Outer Richmond	18,837	414	16	430	**4%**
94103	SOMA	14,322	1,072	38	1,110	**3%**
94109	Russian Hill/Polk Gulch	36,850	1,235	39	1,274	**3%**
94104	Financial District	275	32	1	33	**3%**
94134	Visitacion Valley/Portola	12,088	294	6	300	**2%**
94116	Parkside	16,194	539	10	549	**2%**
94123	Marina/Cow Hollow	15,349	785	14	799	**2%**
94108	Chinatown	8,554	378	7	385	**2%**
94102	Tenderloin/Union Square/Hayes Valley	18,713	1,111	10	1,121	**1%**
94132	Lake Merced	11,227	819	3	822	**0%**
94129	Presidio	1,216	431	0	431	**0%**
TOTAL		377,280	12,885	651	13,536	4.8%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013

Neighborhoods

The table below shows the five neighborhoods with the highest number of commercial Airbnb listings.

Table 10: Neighborhoods with Most Commercial Hosts					
Zip code	Neighborhood	Entire Unit	Private Room	Shared Room	TOTAL
94110	Inner Mission	199	112	4	315
94117	Haight-Ashbury/Western Addition	122	70	1	193
94114	Castro/Eureka Valley	117	70	1	188
94109	Russian Hill/Polk Gulch	89	37	4	130
94103	SOMA	71	34	8	113

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

Evictions

Table 11 below shows that the neighborhoods with the highest number of listings also have the highest number of evictions. While the use of housing units after evictions cannot be determined from Rent Board data, landlords in neighborhoods that are popular areas for short-term rentals may have financial incentives to remove existing tenants.

About 71.9 percent of San Francisco's rental stock is rent-stabilized. Housing market rate prices in San Francisco have been increasing significantly over the past few years, and landlords, already encouraged to capture the full market value on the long-term rental market, may be further encouraged by the higher revenue that could be generated through short-term renting. The San Francisco Rent Board provided data which showed that evictions have increased by 37 percent from 2011 through 2014.

In 2014 there were 2,789 evictions. The table below compares the five neighborhoods with the most Airbnb listings to the eviction rates.

				Neighborhood Evictions, as % of Total Evictions in San Francisco	Neighborhood Evictions, Ranked
Zip code	Neighborhood	Number of Commercial hosts	Number of Evictions		
94110	Inner Mission	315	323	12%	1st
94117	Haight-Ashbury/Western Addition	193	212	8%	3rd
94114	Castro/Eureka Valley	188	130	5%	10th
94109	Russian Hill/Polk Gulch	130	269	10%	2nd
94107	Potrero Hill/South Beach	126	51	2%	19th

Table 11: Neighborhoods with Most 2014 Commercial Hosts Compared to Evictions

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; San Francisco Rent Board

As shown in the table above, the Inner Mission, Russian Hill, and Haight-Ashbury had the top three highest eviction rates in 2014 and are also the amongst the top five neighborhoods with highest commercial entire unit and private room Airbnb listings.

Impact of Night Limits
If followed, the various proposed legislation could result in significantly different hosting outcomes for all types of rooms. The estimates in Table 12 below are based on the December 2014 Airbnb webscrape. This webscrape showed 3,651 entire homes, 2,196 private homes, and 266 shared rooms, for a total of 6,113 listings.

Given current booking rates, if regulation that caps the number of un-hosted nights only at 90 nights, were followed, the number of entire homes listed would decrease to 3,115, or by 15 percent. Private and shared rooms would remain unchanged as the current legislation does not restrict hosted nights.

If the number of days for hosted and unhosted nights were capped at 120 nights, the total number of units expected to be listed on Airbnb would decrease from 6,113 to 5,706, or by 7 percent. If the number of nights were capped at 90 nights, the total number would decrease to 5,168 or by 15 percent. If the number of nights were capped at 60 nights, the total number would decrease to 4,471 or by 27 percent.

The table considers the financial incentives a commercial user would incorporate into their decision to host a short-term rental or a long-term rental based on American Community Survey 2013 rental rates by zip code. All casual users are

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expected to remain in the short-term rental market, and only modify their behavior to abide by the caps. A commercial user would compare the expected monthly revenues from participating in the short-term rental market based on the cap to the monthly rate on the long-term market.

Table 12: Number of Listings in Primary Scenario, by Policy Limits					
	Current scenario	Current Scenario if Fully Enforced Regulation (Max 90 un-hosted nights)	120 Night Max on All Unit Types	90 Night Max on All Unit Types	60 Night Max on All Unit Types
Entire Units Remaining	3,651	3,115	3,390	3,115	2,634
Private Rooms Remaining	2,196	2,196	2,060	1,803	1,602
Shared Rooms Remaining	266	266	256	250	235
TOTAL	**6,113**	**5,577**	**5,706**	**5,168**	**4,471**

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

Table 13 below shows the corresponding number of units that are estimated to exit the short-term rental market and may be available for long-term rent under the various policy proposals and assuming effective enforcement.

Table 13: Number of Listings that Exit the Short-term Rental Market				
	Current Scenario if Fully Enforced Regulation	120 Night Max on All Unit Types	90 Night Max on All Unit Types	60 Night Max on All Unit Types
Entire unit	536	261	536	1,017
Private room	0	136	393	594
Shared room	0	10	16	31
Total	**536**	**407**	**945**	**1,642**

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013 median gross rents

If Regulations Are Fully Enforced Many Commercial Hosts Will Switch to Long-term Rentals

The analysis suggests if regulations are followed at almost all levels then many commercial hosts will no longer find their operations economically feasible compared to the traditional long-term rental market. This is because with limitations on the number of nights that can be rented annually hosts would make more money renting continuously on the long-term market, particularly for entire units. Some amount of commercial hosts would remain because they have relatively high prices that allow them to maintain operations despite any annual limits on the number of nights per year. Other commercial hosts might raise their prices in response to any limitations, which would keep their unit off the long-term market. However, this group would likely be small since there market limits on how much guests are willing to pay per night.

Commercial Hosts Might Be Replaced by Additional Casual Hosts

The primary group of hosts that remain are the casual hosts. This is because they are less sensitive to revenue lost from capping the number of nights per year. Most aren't hosting at or above the various maximums modeled already and only a small percentage would lose revenue in any of the models.[25] As a side business, casual hosts aren't in the business of commercial lodging and unlike commercial hosts they haven't invested money on additional property to run a short-term rental business.

If demand from guests remains high, the bookings currently filled by commercial hosts are expected to be replaced by additional casual hosts. This would continue to deliver the many benefits of short-term rentals to the City and would replace much of the transient occupancy tax revenue that commercial host activity is currently providing.

Current Enforcement

The current regulations allow some limited commercial activity of short-term rentals in residential properties. Despite this change, the new laws have added few tools for the City to enforce short-term rentals. The primary challenge remains that short-term rentals are businesses that operate in private residences and it is difficult to know what is happening behind closed walls. Companies such as Airbnb have been unwilling to share booking information with the City and others such as VRBO don't facilitate individual transactions and don't have aggregate booking data available. Without booking information the City is unable to sufficiently enforce current regulations that limit the number of nights per year in some types of units.

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[25] An estimated #X of casual hosts are currently offering private rooms and shared rooms that are booked for an estimated 61 to 88 nights per year. Under the 60 maximum scenario these casual hosts would lose some revenue because their maximum number of nights would be reduced to 60.

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Limitations of Complaint-based System

Prior to the current regulations enacted in November 2014 that took effect in February 2015, all residential short-term rentals that weren't zoned and permitted as hotels, motels and bed and breakfasts were out of compliance - essentially over 5,000 businesses were operating in the City illegally. Even now that some host's rental activity is permitted, the City's is unable to sufficiently enforce regulations current regulations.

Enforcement is currently reliant on a traditional land use enforcement framework, where complaints trigger investigations. Upon receiving complaints, often from neighbors, violators are cited and asked to appear before an administrative hearing. Alleged violators are given 30 days to come into compliance prior to the hearing. Following the hearing and temporarily suspending business operations, many hosts reportedly return to renting their property short-term. This leaves only limited enforcement options for the City, and a challenge to essentially monitor and document alleged business activities occurring behind closed doors.

Framework Effective for Other Land Use Violations

This complaint-based enforcement framework has historically been effective for other land use violations. This is because most unpermitted commercial land use activities, such as un-approved retail or industrial activities and non-compliant building types were easy to identify and relatively visible to the public. In contrast, the operations of short-term rentals are obscured by vague internet listings and activities that occur within the walls of private residences.

Short-term Rentals Require New Information

Without knowledge of what is occurring within short-term rentals it is nearly impossible to enforce limits on the number of nights that are booked. This information could come from the platforms or, when platforms don't record booking transactions, it could come from the hosts themselves. Access to booking information would allow the Planning Department to better identify violators and substantiate the extent of their violations. This type of data sharing requires a stronger partnership with platforms and hosts to work with the City to ensure compliant hosts are allowed to operate and noncompliant hosts are penalized. If a partnership can't be established, regulations requiring the sharing of data could be considered.

City and State Options

To address these enforcement needs the Board of Supervisors could pass additional legislation requiring that platforms and hosts share booking data that allows the Planning Department to better enforce existing regulation. At the state level, Senator Mike McGuire of Healdsburg introduced state Senate Bill 593. The bill would provide a uniform framework across the state for municipalities to receive booking information on a quarterly basis and hold platforms accountable when their listings violate local laws. The bill would allow municipalities to levy fines against platforms that do not provide data or knowingly list units that violate local regulations.

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Privacy Concerns

In any case, booking data does contain a degree of private information on hosts' activities. Despite its sensitivity, the data is important as it is the only way to monitor the business operations that hosts and platforms are conducting. Currently, the Planning Department maintains its registration information on a database separate and secured from other information systems in the department. It also anonymizes all host information that the public could potentially access. The same level of protections could be applied to booking data they receive from hosts and platforms. Importantly, information on the guests staying in short-term rentals is not needed for enforcement and the City would not need to receive private guest information.

Personal privacy protection for hosts remains important, but hosting is a business activity and a choice hosts make to transform a residential space into a commercial lodging. Like most other businesses and industries, some level of regulatory oversight is required. If handled with confidentiality and hosts' personal privacy in mind, then asking hosts and platforms to provide information on their bookings would be in line with other types of business oversight.

Rate of Registration is Low

Beyond the current enforcement limitations, very few hosts have applied to register their units with the Planning Department, as shown in Figure 14 below. As of May 1, 2015, only 579 hosts have applied. This is a small volume of the total amount of hosts estimated in the City, or 9.5 percent of the 6,113 estimated Airbnb listings as of December 2014, and even a smaller percentage if hosts that use other platforms besides Airbnb are considered. The incoming pipeline for hosts seems small too, with only 550 hosts having applied for business licenses with the Treasurer and Tax Collector since April 30, 2015. However, an unknown amount of hosts may have applied for business permits previously, but the Treasurer and Tax Collector did not track licenses for short-term rentals until recently.

Figure 14: Low Rate of Registration Compared to Total Estimated Units							
Estimated total number of listings in 2014	Applied for Business License prior to February 2015	Applied for Business License after February 2015	Short-term Rental Applications Submitted to the Planning Department for Review	Certificates Issued	Incomplete Applications	Applications Under Review	Applications Awaiting Review
6,113	Unknown [26]	550	579	282	77	50	170
	Unknown	9.0% of total listings	9.4% of total listings	48.7% of applications	13.3% of applications	8.6% of applications	29.4% of applications
	As of April 30, 2015		*As of May 1, 2015*				

Sources: Budget and Legislative Analyst Utilization Model, San Francisco Treasurer and Tax Collector, and San Francisco Planning Department

The low rate of applications implies that hosts have limited incentive to apply, don't know about the current regulations or have faced challenges in the application process. Our analysis shows there are an estimated 1,922 hosts operating at a commercial level and 536 renting their entire house for over the current 90 day un-hosted maximum. These hosts might choose not to register in order to avoid any unnecessary attention on their operations. However, even if all hosts applied, the Planning Department would have a very limited capacity to monitor compliance with current regulations without additional information on host's bookings.

Require Verification of Hosts by Platforms
Finally, increased registration and compliance with regulations could be encouraged if platforms only listed hosts with verified registration with the City. This again could be accomplished through stronger partnerships with platforms or in lieu of cooperation, regulations requiring platforms to verify the legality of units they list should be considered.

Alternative Scenarios

As discussed, the Budget and Legislative Analyst prepared two other scenarios in addition to the primary scenario presented above to estimate the impact of short-term rentals on the housing market. One of the two alternative scenarios presents a lower impact on the long-term rental market than the primary scenario used and the other scenario presents a higher impact.

The key differences in assumptions used to prepare these alternative scenarios were as follows. For the lower impact scenario, a threshold of 90 booking nights

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[26] Treasure & Tax Collector did not track business licenses specific to short-term rentals prior to February 2015.

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was used to distinguish casual and commercial hosts rather than the 58 used in the primary and higher impact scenarios. This resulted in a smaller number of hosts being classified as commercial and reduced the number of housing units removed from the long-term rental market through short-term rentals. For the higher impact scenario, a 32 percent rate of reviews per booking was used rather than the 70 percent used in the primary and lower impact scenarios. This resulted in more bookings per listing being assumed and thus increased the number of hosts classified as commercial and impacting the long-term rental housing market. The results are presented in the following tables.

Table 15: Higher Impact Scenario: Estimate of Short-term Rental Housing Units in San Francisco, by Type of Host, 2014			
Type of Host/Listing	Threshold Number of Days Unit Rented	Est'd # of Units as of December 2014	Percentage of Total Units
Casual: Entire unit	58 days or under	1,690	28%
Casual: Private room	88 days or under	1,233	20%
Casual: shared room	88 days or under	184	3%
Total casual:		*3,107*	*51%*
Commercial: Entire unit	over 58 days	1,960	32%
Commercial: Private room	over 88 days	963	16%
Commercial: Shared room	over 88 days	82	1%
Total commercial:		*3,006*	*49%*
TOTAL UNITS		6,113	100%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

Table 16: Lower Impact Scenario: Estimate of Short-term Rental Housing Units in San Francisco, by Type of Host, 2014			
Type of Host/Listing	Threshold Number of Days Unit Rented	Est'd # of Units as of December 2014	Percentage of Total Units
Casual: Entire unit	90 days or under	2,726	45%
Casual: Private room	88 days or under	1,565	26%
Casual: shared room	88 days or under	226	4%
Total casual:		*4,517*	*74%*
Commercial: Entire unit	over 90 days	925	15%
Commercial: Private room	over 88 days	631	10%
Commercial: Shared room	over 88 days	40	1%
Total commercial:		1,596	26%
TOTAL UNITS		6,113	100%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model

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Impacts of the two alternative scenarios on long-term housing by neighborhood are presented in Tables 17 and 18. As can be seen, the lower and higher impact scenarios also show impacts on housing available for long-term rentals.

Zip Code	Neighborhood	Rental Market Size (2013)	Vacant For Rent (2013)	Number of Commercial Unit Listings (Low~ High)	Total Potential Units for Rent (Low ~ High)	Airbnb Commercial Unit Listings as % of Total Potential Units(Low ~ High)
	Table 17: Impacts on Vacant For Rent Housing of Commercial Short-term Rentals for Entire Housing Unit, by Neighborhood (Low ~ High Estimates)					
94158	Mission Bay	2,273	0	1 ~ 4	1 ~ 4	100%
94127	Miraloma/Sunnyside	1,614	24	14 ~ 23	38 ~ 47	37% ~ 49%
94117	Haight-Ashbury/Western Addition	14,686	260	94 ~ 193	354 ~ 453	27% ~ 43%
94110	Inner Mission	19,194	483	144 ~ 321	627 ~ 804	23% ~ 40%
94114	Castro/Eureka Valley	9,921	358	91 ~ 196	449 ~ 554	20% ~ 35%
94107	Potrero Hill/South Beach	9,121	246	62 ~ 117	308 ~ 363	20% ~ 32%
94131	Twin Peaks/Glen Park	6,723	181	31 ~ 81	212 ~ 262	15% ~ 31%
94105	Rincon Hill	2,239	60	12 ~ 26	72 ~ 86	17% ~ 30%
94122	Sunset	12,780	202	49 ~ 80	251 ~ 282	20% ~ 28%
94118	Inner Richmond	12,665	194	30 ~ 71	224 ~ 265	13% ~ 27%
94121	Outer Richmond	11,117	192	31 ~ 58	223 ~ 250	14% ~ 23%
94133	North Beach	12,270	349	43 ~ 92	392 ~ 441	11% ~ 21%
94123	Marina/Cow Hollow	11,211	495	60 ~ 130	555 ~ 625	11% ~ 21%
94115	Western Addition	15,041	305	33 ~ 79	338 ~ 384	10% ~ 21%
94112	Ingleside/Excelsior	8,686	175	20 ~ 45	195 ~ 220	10% ~ 20%
94116	Parkside	5,931	205	15 ~ 31	220 ~ 236	7% ~ 13%
94111	Telegraph Hill/Waterfront	1,892	35	2 ~ 5	37 ~ 40	5% ~ 13%
94109	Russian Hill/Polk Gulch	30,551	1099	66 ~ 151	1165 ~ 1250	6% ~ 12%
94103	SOMA	11,460	899	57 ~ 105	956 ~ 1004	6% ~ 10%
94108	Chinatown	7,697	377	17 ~ 36	394 ~ 413	4% ~ 9%
94134	Visitacion Valley/Portola	5,067	112	6 ~ 9	118 ~ 121	5% ~ 7%
94104	Financial District	259	52	2 ~ 4	54 ~ 56	4% ~ 7%
94102	Tenderloin/Union Square/Hayes Valley	16,644	1360	39 ~ 88	1399 ~ 1448	3% ~ 6%
94124	Bayview/Hunters Point	5,932	146	3 ~ 9	149 ~ 155	2% ~ 6%
94132	Lake Merced	6,793	356	3 ~ 6	359 ~ 362	1% ~ 2%
94129	Presidio	1,385	159	~	159 ~ 159	0%
94130	Treasure Island	860	114	~	114 ~ 114	0%
TOTAL		244,012	8,438	925 ~ 1,960	9,363 ~ 10,398	9.9% ~ 18.9%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013

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Zip Code	Neighborhood	Rental Market Size (2013)	Vacancy For Rent (2013)	Number of Commercial Room Listings (Low ~ High)	Total Potential Rooms for Rent (Low ~ High)	Airbnb Commercial Room Listings as % of Total Potential Units (Low ~ High)
Table 18: Impacts on Vacant For Rent Housing of Commercial Short-term Rentals for Private Rooms, by Neighborhood (Low ~ High Estimates)					
94130	Treasure Island	No data	0	4 ~ 5	4 ~ 5	100%
94158	Mission Bay	2,705	0	1 ~ 2	1 ~ 2	100%
94127	Miraloma/Sunnyside	7,659	71	12 ~ 22	83 ~ 93	14% ~ 24%
94117	Haight-Ashbury/Western Adtn.	19,568	471	71 ~ 98	542 ~ 569	13% ~ 17%
94110	Inner Mission	29,276	940	114 ~ 179	1,054 ~ 1,119	11% ~ 16%
94107	Potrero Hill/South Beach	14,829	388	40 ~ 58	428 ~ 446	9% ~ 13%
94114	Castro/Eureka Valley	17,880	696	71 ~ 102	767 ~ 798	9% ~ 13%
94112	Ingleside/Excelsior	23,498	446	39 ~ 54	485 ~ 500	8% ~ 11%
94111	Telegraph Hill/Waterfront	2,643	46	3 ~ 6	49 ~ 52	5% ~ 11%
94105	Rincon Hill	4,651	89	8 ~ 10	97 ~ 99	8% ~ 10%
94118	Inner Richmond	18,649	409	33 ~ 45	442 ~ 454	7% ~ 10%
94131	Twin Peaks/Glen Park	13,787	385	21 ~ 38	406 ~ 423	5% ~ 9%
94115	Western Addition	18,968	488	27 ~ 46	515 ~ 534	5% ~ 9%
94122	Sunset	23,459	454	25 ~ 35	479 ~ 489	5% ~ 7%
94133	North Beach	14,987	520	24 ~ 39	544 ~ 559	4% ~ 7%
94103	SOMA	14,322	1,072	38 ~ 69	1,110 ~ 1,141	3% ~ 6%
94121	Outer Richmond	18,837	414	16 ~ 25	430 ~ 439	4% ~ 6%
94124	Bayview/Hunters Point	11,096	372	19 ~ 22	391 ~ 394	5%
94109	Russian Hill/Polk Gulch	36,850	1,235	39 ~ 64	1,274 ~ 1,299	3% ~ 5%
94134	Visitacion Valley/Portola	12,088	294	6 ~ 10	300 ~ 304	2% ~ 3%

Table 18: Impacts on Vacant For Rent Housing of Commercial Short-term Rentals for Private Rooms, by Neighborhood (Low ~ High Estimates) (cont'd)					
94104	Financial District	275	32	1 ~ 1	33 ~ 33	3%
94123	Marina/Cow Hollow	15,349	785	14 ~ 24	799 ~ 809	2% ~ 3%
94116	Parkside	16,194	539	10 ~ 16	549 ~ 555	2% ~ 3%
94108	Chinatown	8,554	378	7 ~ 10	385 ~ 388	2% ~ 3%
94102	Tenderloin/Union Sq./Hayes Vly	18,713	1,111	10 ~ 20	1,121 ~ 1,131	1% ~ 2%
94132	Lake Merced	11,227	819	3 ~ 7	822 ~ 826	0% ~ 1%
94129	Presidio	1,216	431	0 ~ 0	431 ~ 431	0%
TOTAL		377,280	12,885	651 ~ 1,004	13,536 ~ 13,888	5 % ~ 7%

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst Utilization Model; American Community Survey 2013

Policy Options

The Board of Supervisors should consider the following actions:

1. Enact legislation requiring hosting platforms to provide host address information and booking information on a quarterly basis for enforcement purposes.

2. Enact legislation requiring hosting platforms to only list units and hosts that are registered with the City.

3. Enact legislation limiting the number of un-hosted nights allowed per year.

4. Amend the Planning Code to allow the Planning Department to levy fines on platforms that list unregistered hosts.

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Appendix: Methodology

<u>Airbnb Listing Counts, Distributions, and Prices</u>

Webscrape Total Counts

The Budget and Legislative Analyst's Office reviewed 7 webscrapes of the Airbnb website prepared by three technology professionals. Webscrapes extract and compile data from the public-facing websites and allow for analysis that would otherwise not be feasible or practical to conduct using a standard browser. All seven of the webscrapes reviews show a consistency over time in the number of Airbnb listings and in rates reported by the different webscrapers. The December 2014 webscrape prepared by Murray Cox was used by the Budget and Legislative Analyst for this analysis as this dataset provided the most comprehensive collection of data. Summary information from each of the seven webscrapes is provided in the Appendix to this report.

The webscrapes used were prepared by the following three individuals. Tom Slee, who works in the software industry, writes about technology and politics, is active in the open data and sharing economy communities, and is based in Waterloo, Ontario. Murray Cox is a community activist based in New York City who utilizes his technology skills for various non-profits and community groups. He has a degree in computer science from the University of Sydney. Gus Dolan collaborates with the Anti-Eviction Mapping Project.

Webscrapes are subject to limitations: there may be duplicate or inaccurate listings, and webscrape authors may run the scrapes several times to reduce error. Because of the consistency of the information in the webscrapes reviewed, the Budget and Legislative Analyst concluded that they were reliable sources of information for this analysis.

The table below shows the frequency distribution of types of listing by each of the 7 webscrape.

Appendix Table 1: Number of Airbnb Listings, by Type				
	Number of Entire Unit Listings	Number of Private Room Listings	Number of Shared Room Listings	Total Number of Listings
November 2013	3,533	1,917	235	5,685
May 2014	2,991	1,733	192	4,916
August 2014	3,001	1,691	173	4,865
December 2014	3,651	2,196	266	6,113
December 2014	3,329	1,938	235	5,502
February 2015	3,176	1,844	229	5,249
February 2015	2,988	2,101		5,089

Source: Webscrapes prepared by: November 2013, May 2014, August 2014, December 2014 and February 2015: Tom Slee; December 2014: Murray Cox; February 2015: Gus Dolan.

The Budget and Legislative Analyst conducted a review and sampling of Airbnb's current listings to confirm summary statistics of the webscrapes. Average prices were checked by listing type for each webscrape against the website's reported averages. While variations appear from the different webscrapes, the table below also shows consistent relationships in the prices of the different types of rentals.

Appendix Table 2: Number of Listings				
	Number of Entire Unit Listings	**Number of Private Room Listings**	**Number of Shared Room Listings**	**Total Number of Listings**
November 2013 Tom Slee	3,533	1,917	235	**5,685**
May 2014 Tom Slee	2,991	1,733	192	**4,916**
August 2014 Tom Slee	3,001	1,691	173	**4,865**
December 2014 Murray Cox	3,651	2,196	266	**6,113**
December 2014 Tom Slee	3,329	1,938	235	**5,502**
February 2015 Tom Slee	3,176	1,844	229	**5,249**
February 2015 Gus Dolan	2,988	2,101		**5,089**

Source: Webscrapes prepared by: November 2013, May 2014, August 2014, December 2014 and February 2015: Tom Slee; December 2014: Murray Cox; February 2015: Gus Dolan; Budget and Legislative Analyst review of Airbnb.com in April 2015

Percentage Distribution of Listings by Type

HR&A reported a percentage distribution by Airbnb listing type in 2012 which was described to be based on actual Airbnb data. The table below compares the distribution by webscrapes to the distribution reported by HR&A. We determined the frequency distribution by listing type for each and calculated the percentage of total listings report for each of the webscrapes. We also calculated the percentage distribution based on our review in April 2015 of the website. We compared the distribution by listing type for the webscrapes and our review to the HR&A distribution, as a check on the webscrapes. We found the percentage distributions to be similar.

Appendix Table 3: Percent Distribution of Listings by Type			
	% Entire Unit Listing	% Private Room Listing	% Shared Room Listing
HR&A 2012	63%	35%	2%
November 2013 Tom Slee	62%	34%	4%
May 2014 Tom Slee	61%	35%	4%
August 2014 Tom Slee	62%	35%	4%
December 2014 Murray Cox	60%	36%	4%
December 2014 Tom Slee	61%	35%	4%
February 2015 Tom Slee	61%	35%	4%
February 2015 Gus Dolan	59%	41%	0%
April 2015 Airbnb Website	54%	38%	9%

Source: Webscrapes prepared by: November 2013, May 2014, August 2014, December 2014 and February 2015: Tom Slee; December 2014: Murray Cox; February 2015: Gus Dolan; HR&A report 2012; Budget and Legislative Analyst review of Airbnb.com April 2015

Price Check by Types

We checked the average prices by listing type for each webscrape against the website's reported averages. The New York Attorney General's report in 2014 shows seasonality in the usage of Airbnb, which would affect prices based on demand for Airbnb units. The table below reflects the seasonality, showing higher prices in May, November, and December, and lower ones in April.

Appendix Table 4: Average Prices by Listing Type				
	Average Price of Entire Unit Listings	**Average Price of Private Room Listings**	**Average Price of Shared Room Listings**	**Average Price of All Listings**
November 2013 Tom Slee	$240	$111	$73	$190
May 2014 Tom Slee	$254	$132	$87	$204
August 2014 Tom Slee	$281	$134	$94	$224
December 2014 Murray Cox	$239	$115	$72	$239
December 2014 Tom Slee	no data	no data	no data	no data
February 2015 Tom Slee	$322	$153	$105	$253
February 2015 Gus Dolan	$249	$113		$193
April 2015 Airbnb Website	$232	$115	$71	$173

Source: Source: Webscrapes prepared by: November 2013, May 2014, August 2014, December 2014 and February 2015: Tom Slee; December 2014: Murray Cox; February 2015: Gus Dolan; Budget and Legislative Analyst review of Airbnb.com April 2015

Price Check by Sampling

In order to gather further confidence in the price data from the webscrapes, we collected data internally to check prices reported in the webscrapes. We pulled samples of sizes to obtain a 95 percent confidence level + / - 10 for select neighborhoods. We used the distribution by type to collect samples for each type from three zip codes.

Appendix Table 5: Sampling by Neighborhood		
Zip Code	Total Number of Listings from Airbnb Website	Sample for 95% Confidence Interval
94110	1,000	183
94109	741	120
94103	738	121

Based on the total populations listed by zip code on Airbnb, we selected samples of the sizes found in the table above. We manually went through the website and collected information to check prices and the length of time host is active for our utilization model.

The sampled data was first used to compare the median prices by listing type for each webscrape to our samples. The data showed variations due to seasonality, but showed similarities.

Appendix Table 6: Median Prices of Listings			
	Median Price of Entire Unit Listings	**Median Price of Private Room Listings**	**Median Price of Shared Room Listings**
November 2013 Tom Slee	$193	$99	$54
May 2014 Tom Slee	$201	$111	$62
August 2014 Tom Slee	$214	$118	$79
December 2014 Murray Cox	$190	$105	$60
December 2014 Tom Slee	no data	no data	no data
February 2015 Tom Slee	$249	$141	$83
February 2015 Gus Dolan	$195	$100	
April 2015 Airbnb Website	$182	$110	$60

Source: Source: Webscrapes prepared by: November 2013, May 2014, August 2014, December 2014 and February 2015: Tom Slee; December 2014: Murray Cox; February 2015: Gus Dolan; Budget and Legislative Analyst review of Airbnb.com April 2015

Our samples were also used to check the prices of one of the key webscrapes we utilized in our analysis, the December 2014 Murray Cox webscrape. This webscrape provided a more comprehensive database with locations and dates of activity recorded more thoroughly than the other webscrapes. The table below compares the median reported prices from the December 2014 Murray Cox webscrape and our sample data. These numbers show similarities in the data.

Appendix Table 7: Median Prices of Listings for Sampled Neighborhoods				
		Median Price of Entire Unit Listings	Median Price of Private Room Listings	Median Price of Shared Room Listings
April 2015 Airbnb Website	**94103**	$199	$113	$65
	94109	$195	$107	$159
	94110	$174	$100	$53
December 2014 Murray Cox Webscrape	**94103**	$185	$115	$59
	94109	$193	$120	$74
	94110	$180	$100	$59

Source: Webscrape of Airbnb website prepared by Murray Cox, December 2014; Budget and Legislative Analyst review of Airbnb.com April 2015

Model to Estimate Utilization Rate (Days per Year)

Our model to estimate utilization rate in days per year required several preliminary calculations.

Apparent review rate

Total # reviews / Total # bookings = Review rate   **(1)**

Airbnb stated that the rate of reviews was 72 percent in 2012. However, data on New York City's apparent reviews and bookings show a rate of 30.5 percent. The New York Attorney General's report on Airbnb released in October 2014 shows a total of 497,322 bookings from January 1, 2010 through June 2, 2014. Data pulled from Murray Cox's InsideAirbnb.com showed reviews of 151,623 from January 1, 2010 through June 2, 2014, which is an apparent review rate of 30.5 percent.

We interpret this 30.5% of reviews as the apparent review ratio, in that the number of visible reviews to the number of actual bookings remains a reliable variable assuming

that Airbnb behaves similarly with the San Francisco market in its activities around reviews.

We used both ratios in our calculations. The 30.5 percent apparent review ratio estimated a higher number of bookings to apparent reviews, and the 72 percent review ratio estimated a lower number of bookings to reviews.

 # Days listing active

Date of host join - Date of first review = # Days listing active   **(2)**

The dates a listing is active was calculated by subtracting the date of the host joining from the date of last review. Airbnb has been noted to remove older reviews and alter the review displays.

 # Reviews per average booked nights

(# Reviews for a listing / Review rate) * Average # nights for a listing = Estimated # nights booked for a listing   **(3)**

We divided the number of reviews visible on the site by the review rate to get the estimated number of bookings (see (1)), and multiplied this by the average number of nights per stay of 5.1 as reported by SF Travel. This gives us an estimate of the number of nights the Airbnb listing is occupied.

Utilization rate over lifetime of listing

Estimated # nights booked for a listing / # Days listing active = Utilization rate over lifetime of listing **(4)**

We divide the estimated number of nights booked for a listing (3) by the dates a listing is active (2), to determine the utilization rate over the lifetime of a listing.

Utilization rate model

Utilization rate over lifetime of listing * 365 days = # Days a listing is booked out of the year **(5a)**

We multiple the utilization rate in (4) by 365 days in a year to obtain an estimate of the number of days a listing is booked out of the year. This is our utilization rate.

To put it all together, our model to estimate utilization rate (days per year) is as follows:

([(# Reviews for a listing / Review rate) * Average # of nights for a listing] / # Days listing active) * 365 days = # Days a listing is booked out of the year **(5b)**

Estimated revenue

Price per night * # Days a listing is booked out of the year = Estimated revenue per listing per year **(6a)**

Estimated revenue per listing per year / 12 = Estimated revenue per listing per month
(6b)

The webscrapes provided listing prices per night. We multiplied this by the number of days a listing is booked out of the year to get an estimate of the revenue per year. We divided the estimated revenue per year by 12 to get an estimated revenue per month.

<u>Number of Rentals Available "for rent" by Neighborhood</u>

The American Community Survey is conducted annually by the U.S. Census Bureau. Compared to the relatively comprehensive 10-year Census, the American Community Survey is a "mandatory ongoing statistical survey that samples a small percentage of the population every year." The American Community Survey selects approximately 1-in-480 addresses to mail 3.5 million questionnaires annually. While this is a significant number of individuals and addresses surveyed, it still relies on statistical assumptions, which result in a margin of error for every American

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Community Survey estimate. The American Community Survey Rental Vacancy figures include all units listed for rent but currently not occupied and all units that are rented but have yet to be occupied by the incoming tenant. The total number of units that are vacant but have incoming tenants is expected to be small, but does somewhat inflate the size of the available rental units listed on the market.

Another survey challenge of the American Community Survey is that field representatives are only deployed to review addresses which did not reply by mail, internet or phone. As such, there are no field representatives present to independently assess the units reported by mail, internet or phone. If a survey respondent has any reason to falsely report or not report a vacant unit these false responses are then included in the data. Despite these shortcomings, the American Community Survey vacancy data was the most reliable, comprehensive, and up-to-date data source identified by the Budget and Legislative Analyst.

Size of Rental Market by Neighborhood

The American Community Survey includes an estimate of Rental Vacancy Rates, and the rental market size by neighborhood was backed out of the 5-year estimate of the Rental Vacancy Rate. The American Community Survey summary of definitions defines the Rental Vacancy Rate as "The rental vacancy rate is the proportion of the rental inventory that is vacant "for rent." It is computed by dividing the number of vacant units "for rent" by the sum of the renter-occupied units, vacant units that are "for rent," and vacant units that have been rented but not yet occupied, and then multiplying by 100. This measure is rounded to the nearest tenth."

American Community Survey estimates vacant units "for rent," renter-occupied units, and rented but not yet occupied units. There three were added to find the size of the rental market. This was checked against the American Community Survey's estimate of the overall housing stock and subtracting out the home ownership rate for the city to get the size of the rental market.

Rental Unit and Room Prices

Gross rents reported by the American Community Survey were used for 2013 rents. Zillow median rental prices by zip code over 2014 were used for market rate comparisons.

Appendix Table 8: Rents by Neighborhood			
Zip Code	Neighborhood	Median Rent (2013)	Room Rental Price (2013)
94102	Tenderloin/Union Square/Hayes Valley	$2,326.51	$840
94103	SOMA	$3,460.00	$922
94104	Financial District	$2,709.00	$673
94105	Rincon Hill	$2,984.33	$2,000+
94107	Potrero Hill/South Beach	$2,677.14	$2,000+
94108	Chinatown	$3,107.21	$1,019
94109	Russian Hill/Polk Gulch	$2,745.13	$1,379
94110	Inner Mission	$2,606.35	$1,459
94111	Telegraph Hill/Waterfront	$7,051.04	2,000+
94112	Ingleside/Excelsior	$2,404.98	$1,398
94114	Castro/Eureka Valley	$3,140.04	$1,771
94115	Western Addition	$2,648.82	$1,563
94116	Parkside	$2,060.63	$1,639
94117	Haight-Ashbury/Western Addition	$3,420.32	$1,732
94118	Inner Richmond	$2,305.93	$1,621
94121	Outer Richmond	$2,024.53	$1,512
94122	Sunset	$2,242.05	$1,663
94123	Marina/Cow Hollow	$2,836.71	$1,838
94124	Bayview/Hunters Point	$2,025.66	$892
94127	Miraloma/Sunnyside	$2,439.37	$2,000+
94130	Presidio	-	$1,582
94131	Twin Peaks/Glen Park	$2,469.24	$1,728
94132	Lake Merced	$2,786.42	$1,797
94133	North Beach	$3,288.60	$1,274
94134	Visitacion Valley/Portola	$2,486.89	$1,101
94158	Mission Bay	$3,235.72	$2,000+

Source: American Community Survey 2013

Appendix Table 9: Market Rates by Neighborhood				
Zip Code	Neighborhood	Market Rental Rate (2014)	Average Number of Bedrooms (2013)	Room Market Rental Price (2014)
94102	Tenderloin/Union Square/Hayes Valley	$3,512	0.82	**$4,300**
94103	SOMA	$3,670	1.19	**$3,079**
94104	Financial District	$3,940	0.62	**$6,336**
94105	Rincon Hill	$4,265	1.48	**$2,887**
94107	Potrero Hill/South Beach	$3,819	1.58	**$2,419**
94108	Chinatown	$3,412	1	**$3,405**
94109	Russian Hill/Polk Gulch	$3,600	1.12	**$3,205**
94110	Inner Mission	$3,782	1.95	**$1,943**
94111	Telegraph Hill/Waterfront	$3,815	1.31	**$2,905**
94112	Ingleside/Excelsior	$2,763	2.55	**$1,083**
94114	Castro/Eureka Valley	$4,331	1.94	**$2,228**
94115	Western Addition	$3,594	1.6	**$2,248**
94116	Parkside	$3,314	2.63	**$1,261**
94117	Haight-Ashbury/Western Addition	$3,751	1.81	**$2,071**
94118	Inner Richmond	$3,750	2.11	**$1,781**
94121	Outer Richmond	$3,087	2.16	**$1,432**
94122	Sunset	$3,065	2.25	**$1,363**
94123	Marina/Cow Hollow	$4,021	1.56	**$2,535**
94124	Bayview/Hunters Point	$2,375	2.54	**$933**
94127	Miraloma/Sunnyside	$4,140	2.98	**$1,391**
94129	Presidio	$3,344	2.71	**$1,234**
94131	Twin Peaks/Glen Park	$3,574	2.13	**$1,679**
94132	Lake Merced	$2,911	2.3	**$1,265**
94133	North Beach	$4,068	1.49	**$2,731**
94134	Visitacion Valley/Portola	$2,836	2.62	**$1,081**
94158	Mission Bay	$3,887	1.36	**$2,853**

Source: American Community Survey 2013, Zillow.com

Eviction rates

The San Francisco Rent Board provided data on the number of eviction notices filed. The Rent Board does not track the purpose of evictions systematically and does not follow up on outcomes of notices filed, but stated that the notices filed are a reliable indicator of the number of actual evictions.